PATENT ABSTRACTS OF JAPAN

(11)Publication number:

09-141193

(43)Date of publication of application: 03.06.1997

(51)Int.Cl.

B05D 5/00 B05D 7/00 B05D 7/04 B05D 7/14 B05D 7/24 C09D163/00 C09D183/06

(21)Application number: 07-305929

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(22)Date of filing:

24.11.1995

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(54) COATED PLATE WITH HIGH RESISTANCE TO POLLUTION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a coated plate bearing a coating which is formed from a coating material cured and dried at normal temperature and, at the same time, curable by thermal promotion at relatively low temperature and has high surface hardness, weather resistance, durability, and especially high poliution resistance for a long duration.

SOLUTION: This coated plate has a primer layer 2 of an epoxy type primer coating material formed on a substrate 1 and an upper coating layer 3 formed on the primer layer 2 of an upper coating material containing an oligomer solution in which silica of organosilane produced by partial hydrolysis of the hydrolyzable organosilane in colloidal silica is dispersed, polyorganosiloxane containing silanol group, a linear polysiloxane containing silanol group, a linear polysiloxane containing hydroxyl groups in both terminals, and a curing catalyst.

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radical of substitution same [R¹] or of a different kind or the unsubstituted carbon numbers 1-9 is shown, of an organosilene which carries out partial hydrolysis under conditions which use water 0.001 -0.5 mol per [Claim 1]It has the primer layer formed from an epoxy system primer paint on the surface of a base material. Are finishing coat formed in the surface of this primer layer from top coat a coated plate which it. m shows an integer of 0-3 and X shows a hydrolytic basis. A hydrolytic organosilane expressed in colloidal allice distributed by en organio solvent, water, or those mixed solvents, A silice dispersed oligomer solution has, and said top coat, (A_0) General formula $R^1_m SiX_{4-m} (0)$ (among a formula) A monovalent hydrocarbon

taid 1 Eq of hydrolytic besis (X)s, (B_Q) Average composition formula R² S(OH) _bO (4-a-b) / 2^(II) (among a

0,0001 <-b<-3, and a+b<4, respectively. Polyorganosiloxane which is expressed and contains a silanol group gredient 1 aforementioned (B_0) weight section is blanded to the one to ingredient 99 aforementioned (A_n) In a molecule, (C_0) Empirical formula $HO(\mathbb{R}^2_2\,\mathrm{SiO})_n H$ (III) (among a formula) \mathbb{R}^2 — said formula (II) — the content, and said at least 50-mol% of hydrolytic organosilane is an organosilane of m= 1, While the 99 to same as an inner thing — n — three or more integers. With a straight-chain-shape both-ends hydroxyl patalyst, inside of the aforementioned (A_n) ingredient, Said silica is contained five to 95weight % as solid weight section . (However, the total quantity of an ingredient (A_0) and an ingredient (B_0) is 100 lt is a moup content polysiloxane (straight-chain-shape polysiloxanediol) expressed. (D_R) Including a curing formula) A monovalent hydrocarbon radical of substitution same [\mathbb{R}^2] or of a different kind or the unsubstituted carbon numbers 1-8 is shown, a and b are numbers which fill a relation of 0.2<=a<2,

forementioned (C_0) ingredients to the above (A_0) , (B_0) , and (D_0) sum total solid content of an ingredient. Claim 2]The contamination-resistant coated plate according to claim 1 in which said base material is an Claim 3]The contamination-resistant coeted plate according to claim 1 in which said base material is a veight section) A contamination-resistant coated plate which contains 0.1 to 70 weight % of the organic cured body. netal plate.

Claim 4]The contamination-resistant coated plate according to claim 1 in which said base material is a Claim 5]The contamination-resistant coated plate according to claim 1 in which said base material is a vater glass decorative sheet.

Claim 7]A contamination-resistant coated plate given in either characterized by comprising the following Claim 6]A contamination-resistant coated plate given in either from Claim 1 in which said epoxy system rimer paint is an epoxy resin primer paint to 5.

said epoxy system primer paint is epoxy resin (A₁) and/or silicone resin modified epoxy resin 100 weight

ttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_ogi_ejje?atw_u=http://www4.ipdl.inpit.go.jp/Toku... 2010/19/19 (G_i) 0.01 to curing catalyst 30 weight section, and general formula (D_i) $R^3R^3\Gamma^2$ (IV) $(R^3$ and R^4 among a One to hydrolytic organic silicon compound 400 weight section which has at least one isocyanate group formula) Expressing a univalent hydrocarbon group independently, respectively, Y expresses a univalent and/or an isooyanuric ring which were combined with a silicon atom via at least one carbon atom. (B,) At least one hydrolytic basis combined with a silicon atom.

JP,09-141193,A [CLAIMS]

hydrolytic besis. A hydrolytic JIORUGANO silane expressed and/or its one to pertial hydrolysis condensate 300 weight section

Claim 8]Said cpoxy system primar paint ((A,) e) ethylene type monomer 99.5 - 75-mol %, (b) General

vinyl group, and R⁶ expresses a univalent hydrocarbon group of the carbon numbers 1−10, and X, A basis ormula R⁵SIX_mR⁸ (3-_{m)} (V) (among a formula) R⁵ expresses a univalent hydrocarbon group containing a

same or different, R^8 expresses a hydrogen atom or a univalent hydrocarbon group, a is the number of 1,0selected from groups which consist of an alkoxyl group of the carbon numbers 1–4, an alkoxy alkoxyl group copolymerization, and a $\langle (B_2)$ c) bisphenol A-epichlorohydrin system epoxy resin, (d) General formula (R^2) .7, b is the number of 0.05-0.2, and o is a number expressed with (4-a-b) / 2, x is two or more numbers. expressed, m expresses an integer of 1-3. 0.5-25 mol of unsaturation group content silicon compound ½ of the carbon numbers 2-6, and an oxime group of the carbon numbers 2-4 which can be hydrolyzed is SI(OR?) $_{\mathbf{b}}\mathbf{o}_{\alpha}(\mathbf{M})$ (among a formula) R 7 expresses a univalent hydrocarbon group which is mutually the Epoxy denaturation silicone resin obtained by making polyorganosiloxane expressed react, and a general expressed, A hydrolytic basis content vinyl system copolymer produced by making carry out

R¹⁰ expresses a univalent epoxy functional organic group, p is an integer of 0-100, and q is an integer of 1- \mathbb{R}^3 among a formula a univalent hydrocarbon group which is mutually the same or different) \llbracket express and \rrbracket 100. A contamination-resistant coated plate given in either from Claim 1 containing epoxy modified silicone

oil expressed and an organic solvent (D₂) to 5.

 $\begin{array}{c} CH_{a} & CH_{a} \\ CH_{a} & -S1 - O \\ CH_{a} & -S1 \\ CH_{a} & \\ \end{array} \xrightarrow{ \begin{array}{c} CH_{a} \\ S1 \\ CH_{a} \end{array} } \begin{array}{c} CH_{a} \\ S1 - O \\ \end{array} \xrightarrow{ \begin{array}{c} CH_{a} \\ S1 \\ CH_{a} \end{array} \xrightarrow{ \begin{array}{c} CH_{a} \\ S1 \\ CH_{a} \end{array} \xrightarrow{ \begin{array}{c} CH_{a} \\ S1 \\ CH_{a} \end{array} } \begin{array}{c} CH_{a} \\ S1 - CH_{a} \end{array} (W)$

[Translation done.]

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DETAILED DESCRIPTION

Detailed Description of the Invention

[Field of the Invention] in this invention, it is constructed in more detail about a contamination-resistant costed plate at the circumference of a road and the side in a tunnel, the inner surface of a building and an outside surface, a windowpane, and the range of a kitchen, the circumference of a sink, the circumference Therefore, it is related with the coated plate which demonstrates the resistance to contamination of a ventilation fan, etc.

outstanding over the long period of time to exhaust gas, a general pollutant, scribble of a car, etc.

decorative sheet, in order to apply water glass to a base material, it must print at an elevated temperature, water glass has very high surface hardness, a crack cannot enter essily and it is constructed by many roads and tunnel now, but resistance to contamination is dramatically low. In the case of manufacture of a known as an example of representation of the coated plate constructed on a road and the side in a tunnel, xoellent in water repellence, protection-against-dust nature, and a mold-release characteristic. However, represented by rain Jimi etc., it will become dirty, and omission has the fault that it is very bad. Since the the inner surface of a building, and an outside surface. As compared with the conventional organic paint coated steel sheet, the coated steel sheet of this high durability paint has good weatherability, and it is surface hardness of a coat is low, when it constructs on a road, a crack enters easily with a pebble etc. system, an acrylic silicon system) and the decorative sheet which applied water glass are generally well and it also has the fault of producing degradation from there. Since the decorative sheet which applied Description of the Prior Art]Conventionally, the coated steel sheet of a high durability paint (a fluorine once it is polluted so that it may be inferior to long-term performance maintenance and may be

nolding board have appeared on the market to the general market in recent years. They are a hard court of However, since said hard court has too high surface hardness, it produces a grack easily in small stress. If (0003) Many things which parformed hard court processing and endurance processing on the plasticthe **** and a polycarbonate sheet, and the polyester film which carried out the surface treatment. it results in said film, the commercial item of a contamination-resistant use has few numbers, and, and if a production line with oven is not used, it cannot manufacture.

coating material excellent in weatherability (for example, refer to JP,S56-15827,B). The cured coating of 0004]On the other hand, the silicone resin composition is known as a room-temperature-setting type characteristic, water repellence, and heat resistance. However, the pencil hardness has only 2H and a this silicone resin composition has dramatically outstanding solvent resistance, a mold-release noreover, a film's own endurance is dramatically low.

0005]it has a siloxane bond as a main skeleton, and what is indicated by JP.H4-175388,A is known as a 'oom-temperature-setting type coating material which excels said high durability paint in weatherability further, however, although weatherability and surface hardness are boiled markedly and it excels, about esistance to contamination, it cannot be said that it excels dramatically. prack will enter easily with a pebble etc.

Problem to be solved by the invantion While carrying out the dry hard of the purpose of this invention at which has the coating film which it not only excels in weatherability and endurance, but was excellent in formed from a possible paint, and its surface hardness is high, and there is in providing the coated plate ordinary temperature, comparatively, hardening by the promotion of haating in low temperature is also

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JP,09-141193,A [DETAILED DESCRIPTION]

esistance to contamination over especially the long period of time in the outermost surface.

iniahing coat formad in the surface of this primer layer from top coat. Said top coat is general formula $(A_{
m b})$ primer layer formed from the epoxy system primer paint on the surface of the base material, and has the SiX_{4-m}(I) (among a formula). The monovalent hydrocarbon radical of substitution same [R¹] or of a Means for solving problem] The contamination-resistant coated plate concerning this invention has the

Empirical formula ${
m HO(R_2^2~SiO)}_{
m n}{
m H~(II)}$ (the inside of a formula and ${
m R^2}$ are said formula (II)s it is the same as content polysiloxane (straight-chain-shape polysiloxanadiol) expressed, (D₀) Including a curing catalyst, the and said at least 50-mot% of hydrolytic organosilane is an organosilane of m= 1, While the 99 to ingredient 1 different kind or the unsubstituted carbon numbers 1-9 is shown, m shows the integer of 0-3 and X shows =+b<4, respectively. Polyorganosiloxane which is expressed and contains a silanol group in a molecule, $({
m C_0})$ section) 0.1 to 70 weight % of the aforementioned (C_0) ingredients are blended to the above (A_0) , (B_0) , and ydrolytic basis (X)s, (B₂) Average composition formula R² Sλ(OH) _bO _{(4-w-b) / 2}(II) (smong a formula) The carbon numbers 1-8 is shown, a and b are numbers which fill the relation of 0.2<=a<2, 0.0001<=b<=3, and shydrolytic basis. The hydrolytic organosilane expressed in the colloidal silica distributed by an organic solvent, water, or those mixed solvents. The silica dispersed oligomer solution of an organosilane which naide of the aforementioned (A_0) ingredient. Said silioa is contained five to 95weight \aleph as solid content, nonovalent hydrocarbon radical of substitution same [R²] or of a different kind or the unsubstituted aforemantioned (B_0) weight section is blended to the one to ingredient 99 aforamantioned (A_0) weight section . (However, the total quantity of an ingredient (A_0) and an ingredient (B_0) is 100 it is a weight an inner thing, and) n is three or more integers. The straight-chain-shape both-ends hydroxyl group carries out partial hydrolysis under the conditions which use water 0.001 -0.5 mol per said 1 Eq of

block. The been material at large which made horganic materials, such as JIS-45411 torrazzo, a JIS-54412 presensed-corrors double 1 labs, 2-24616 M.D. paul, 1JS-44511 hollow prestressed concrete seed, and JIS-41250 common brick, harden and fabricate is pointed out.
(0010) Hith said metal plates, for example JIS-43101 rolled plates, JIS-44000 aluminum, and the board of an street, a highway, and the side of a tunnel, When constructing to the circumference of internal and external 0009]With said inorganio cured body, for example USS-A5430 fiber rainforced coment plate, USS-A5422 commic-industry system siding, USS-A5402 comented excelsior board, USS-A5414 pulp coment board, USS-A5402 oircumference of a ventilation fan, etc., an inorganic cured body from a viewpoint that it can attach easily, a metal plata, a water glass decorative sheet, a plastic-molding board, etc., are preferred. A5426 siste and a wood wool cement laminate sheet, JIS-A6901 pisster-board products, JIS-A5208 olay roofing tile, JIS-A5402 pressad cement roof tile, JIS-A5209 olay tile, a JIS-A5402 erructural concreta 0008]Athough limitation in particular is not carried out, as a base material used by this invention A local surfaces of a building, a windowpane, and a range of a kitchen, the circumference of a sink, a D₀) the sum total solid content of an ingredient.

oossible to consider it as a base material without a void by the surface being filled up with polymer cement cinforced plastics, etc. to a sheet shaped or film state, for example. Although a base material with many 0011]Said plastic-molding board refers to what fabricated thermosetting plastic, thermoplastics, fiber or putty. In that case, it cannot be overemphasized that the primer used for this invention sticks on loids is often shown in the surface in an inorganic cured body, when it is such a base material, it is slate, and printed it, for example. solvmer cement or putty.

aluminum alloy, A metal plate JIS-G3302 hot-dip zino-coated carbon steel sheet, JIS-G4304, G4305 rolling

stainless steel plate, JIS-G3303 tin sheet, and at large [other] is pointed out. Said water glass decorative sheet refers to the decorative sheet etc. which applied sodium silicate to cement base materials, such as a 0012]In the case of the water glass decorative sheet, have come out to the commercial scene as a tunne decorative sheet itsaif by applying further to the surface of this decorative sheet the primer paint and top nvention, although limitation in particular is not carried out, the 1st, 2nd, and 3rd epoxy system primer nner package board as it is now, but. The contamination-resistant costed plate which could give the coat which are used for this invention can be created. As an epoxy system primer paint used by this contamination-resistant function and was dramatically rich in endurance from the endurance of the

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commercial solvent systam two-componant type cpoxide primer, a solvent system two-component type (0013)Said 1st epoxy system primer paint refers to an epoxy reain primer paint, and as the example, A paints ato, that are described below are mentioned, for example.

esin (A₁) and/or sillcone resin modified epoxy resin 100 weight section. (B₁) At least one hydrolytic basis combined with the silicon atom. Ona to hydrolytic organic silicon compound 400 weight section which has It least one isocyanato group and/or isocyanuric ring which were combined with the silicon atom via at component type epoxy emulsion sealar, ctc. are mentioned. Said 2nd epoxy system primer paint Epoxy poxy sealer, a drainage system two-component type epoxy emulsion primer, a drainage system two-

JV) (R³ and R⁴ among a formula) Expressing a univalent hydrocarbon group independently, respectively, Y east one carbon atom, (C $_{i}$) 0.01 to curing catalyst 30 weight section, and general formula (D $_{i}$) $\mathrm{R}^{3}\mathrm{R}^{4}\mathrm{SiY}_{2}$ expresses a univalent hydrolytic basis. The hydrolytic JIORUGANO silane expressed and/or its one to partial hydrolysis condensate 300 weight section are included.

out. For example, bisphenol A digiyoidyl ether and its chain polymer, Tetrabromobisphenol A digiyoidyl ether the epoxy compound which has two or more epoxy groups in a molecule, and means from a lovr-molecular methylcyclohexylmethyl(3,4-epoxy-6-methylcyclohexane)carboxylate, the liquefied apoxy compound which methyloyolohexylmethyl), etc. are mentioned, in addition are generally used as reactive diluant of an epoxy thing to the thing of a high polymer. As such an epoxy resin, although limitation in particular is not carried 2nd epoxy system primer paint. The epoxy resin used as the aforementioned (A₁) ingredient is defined as Vinyloyolohexene dioxido, 3,4-cpoxyoyolohexylmethyl (3,4-epoxy cyclohexene) parboxylate, 3,4-epoxy-6-0014]The aforementioned (A₁) ingredient is an ingredient which gives a strong adhesive property to the and its ohain polymer, Glycidyl ether type epoxy resins, such as biaphenol F diglycidyl ether and phenol novolak type opoxy rosin; Phthalic acid diglycidyl ester, Tetrahydrophtal acid diglycidyl ester, diglycidyl nexahydrophthalate, Glycidyl aster typed epoxy resin, such as 3-methyl diglycidyl hexahydrophthalate; has two or more epoxy groups which cycloaliphatic epoxy resin, such as bis adipate (3,4-epoxy-6-

ultraviolet rays-proof are improved. What carried out copolycondensation also of what only mixed an epoxy such a silicone resin modified epoxy resin. A rate with a part for a part for an epoxy resin and silicone resir diglyoidyl ether, trimethylolpropane triglycidyl ether, glycerol triglyoidyl ether, etc. can also be used. Only aforementioned (B₁) ingredient becomes a large area more by using a silicone resin modified epoxy resin, denaturalized an above-mentioned epoxy resin by polyorganosiloxane resin. While compatibility with the esin and polyorganosiloxane resin in the range which shows compatibility mutually may be sufficient as yitches, and 15 to 70 weight % of silicone pitches on balance of an adhesive property, a water resisting one sort may be used for these and they may use two or more sorts together. [0015]A silicone resin modified opoxy resin used as the aforementioned (A_i) ingredient refers to what n a silicone resin modified epoxy reain has preferred within the limits of 30 to 85 weight % of epoxy

resin --- for example, Polyethylene glycol diglycidyl ether, polypropylene glycol diglycidyl ether, butanediol

which makes an adhesive property between a primer layer and finishing coat revaal while it reacts to the [0016]A hydrolytic organic silicon compound used as the aforementioned (B,) ingredient is an ingredient aforementioned (A_{i}) ingredient and strengthens more the adhesiva property of a primer layer to a base naterial. As a hydrolytic organic silicon compound which has an isocyanato group. Although limitation in socyanate methyl group content Silang corresponding to these, and 4-isocyanatobutyl group content socyanatopropylethyl dimethoxyshiran, 3-isocyanato propylmethyl diethoxysilane, Isocyanato group Silang, etc. are mentioned. These partial hydrolysis condensates can also be used. [0017]As a hydrolytic organic silicon compound which has an isocyanuric ring, although lanitation in triethoxysilane, 3-isocyanatopropyltris (2-methoxyethoxy) Silang, 3 functionality Silang, such as 3particular is not carried out, for example 3-isocyanato propyltrimethoxy silane, 3-isocyanatopropyl socyanatopropyltris (methylethyl ketoxime) Silang, 3-isocyanato propylmethyl dimethoxysilane, 3content Silang like 2 functionality Silang [. such as 3-isocyanatopropylethyl diethoxysilane,]; and property, and weatherability, although limitation in particular is not carried out. varticular is not carried out, it is a general formula, for example. [0018] Chemical formula 21

P.09-141193,A [DETAILED DESCRIPTION]



expresses divalent hydrocarbon groups, such as an alkylene group, R¹² expresses a univalent hydrocarbon 0019](Three Q among a formula –R 11 SiR 12 $_{\rm X_{3-c}}$ group same or of a different kind) [express and] R 11

Jescribed the ingredient at large previously (B_{i}) is illustrated. Although limitation in particular is not carried group. X expresses a univalent hydrolytic basis, and c is an integer of 0-2. What is expressed is mentioned Among the above-mentioned formula, although limitation in particular is not carried out as R11 and X, what imitation in particular is not carried out, specifically, each of three Q is 3-(trimethoxysilyI) propyl group, 3sthoxysily) propyl group. 4-silylbutyl group content compound corresponding to these, etc. are illustrated cetoxime) silyi] The thing which is a propyl group, 3-(methyl dimathoxy silyi) propyl group, or 3-(methyldi triethoxy silyl) propyl group, and 3. - [Tris(2-methoxyethoxy) silyl] A propyl group, 3 - [Tris(methylethyl) llustrated as R¹², since composition is easy, a methyl group is preferred. As such a compound, although 0020]The curing catalyst used as the aforementioned (C₁) ingredient is an ingredient which makes the reaction between the aforementioned (A₁) ingredient and the aforementioned (B₁) ingredient, and each out but a low-grade alkyl group, vinyl groups, etc., such as a methyl group and an ethyl group, are

hydroxide, such as magnesium hydroxide; an inorganic compound like basic metal salt, such as alkali earth limitation in particular is not carried out as such a ouring catalyst, calcium hydroxide. Alkali carth metal metal oxide; basic zinc carbonate, such as a calcium oxide and magnesium oxide, and basic magnesium polycondensation reaction perform near ordinary temperature, and stiffens a primer paint. Although parbonate, etc. are illustrated.

ethylaceto ASETATO)acetylacetonate aluminum; Aluminum bird isopropoxide, Aluminum alkoxides, such as 0021]As a curing catalyst of another group, disopropoxy (ethylaceto ASETATO) aluminum, Tris(ethylaceto such as the first tin of phenylacetic acid, and the first tin of tropic acid, a metallic element content organic auric acid, the first tin of stearic soid, the first tin of olsic soid, the first tin of palmitoleic soid, the first tin propane dioxybis(ethylaceto ASETATO)titanium and tetrakis (acetylacetonate) titanium; Tetraisopropoxy itanium, Titanium alkoxides, such as tetra-n-butoxytitanium and tetrakis (2-ethylhexyloxy) titanium: The ASETATO)titanium, diisopropoxybis(acetylacetonate)titanium, Titanium chelate compound, such as 1,3irst tin of isobutyric acid, The first tin of octanoic acid, the first tin of naphthenic acid, the first tin of olnnamic acid, the first tin of benzoic acid, the first tin of p-bromobenzoic acid, Carboxylic acid tin salt, of linolic acid, the first tin of beta-banzoylpropionic acid, the first tin of orotonic acid, The first tin of aluminum tributoxide; Diisopropoxy bis(methylaceto ASETATO)titanium, Diisopropoxy bis(ethylaceto ASETATO) aluminum, tris(acetylacetonate) aluminum, Aluminum chelate compounds, such as bis

[0022] As a curing catalyst of another group, 3-aminopropyl trimethoxysilane, 3-aminopropyl triethoxysilane propyltrimethoxysilane and 3-aminopropyl methyl dimethoxysilane N-(2-aminoethyl)-3-aminopropyl methyl expansion and contraction of finishing cost, and bears tha primar layer formed at stress by reacting to the ilmethoxysilane; Carboxylic acid, such as acetic acid or formic acid, Propylamine, 3-methoxypropylamine. 3-ethoxypropylamine, A sec-butylamine, a tert-butylamine, allylamine, 2-ethylhexylamine, diisobutylamine, 0023]One sort of these curing catalysts may be used, or they may use two or more sorts together. The N-(2-aminoethyl)-3-aminopropyl trimethoxysilane, Amino alkyl alkoxysilane, such as 3-(dimethylamino) (diethylamino) propylamine and 3-(dibutylamino) propylamine, etc. which have ammonium are illustrated. bis(2-ethylhexyt)amine, A compound like the ammonium salt obtained from organic amine, such as 3forementioned (D₁) ingredient is an ingredient which gives the outstanding flexibility which follows dilaurate, etc. are illustrated.

compound like organotin compounds, such as dibutyltin diacetate, a dibutyltin oct art, and dibutyltin

aforementioned (A₁) ingredient and/or the aforementioned (B₁) ingredient in the case of hardening of a Dimethyldimethoxyallane, methylphenyl dimethoxysilane, diphenyldimethoxysilane, JIORUGANO orimer paint. As such (D_{i}) an ingredient, although limitation in particular is not carried out,

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allocytismic auch as directly distrovalisme, repulybeloved distrovalisme and dishrobly distrovalisme. The confidence of the confidence of the confidence by the confidence of the confidence by the confidence of the confidence of the confidence of the confidence by the confidence of the confidence of

whether byteconerup proto constring a vivil ground and file converse in trunkent byteconerup ground and the control of the co

(10,002)(P. depresses among the formula the unknicht hydocachool region which in manufally the same of melitarra. (If suggesses a univalent georgy functional organic group, is an integer of 0-100, and q is an integer of 1-100).—The second melitarra (If organizates a univalent georgy functional organic group, is an integer of 0-100, and q is an integer of 1-100).—The second medical single of a george organization of 0, 100, and 100,

(A) ingredient, Although linitation in perticular is not carried out, it is said formule (V), for cosmole, hence Rê incommended from uses of two material acquisition and composition for the 32—exproprophy tops or 3-methanophospospy from 5, said formula (V) Aeff. an shipl group or opining type said as methyl, charles (Anthyl Lond), and holo (E.e. are recommended from the said of two material acquisition and composition incide, and a methyl group is opposibly yreleted from a point of two material

occidented and formula (V) Neds and eith indexide banks, X, Marchy inheadron in particulate in our carried and confidence and an experimental and experimental anear and experimental and experimental and experimental and experi

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JP,09-141193,A [DETAILED DESCRIPTION]

0031]The hydrolytic basis content vinyl system copolymer of tha aforementioned (A₂) ingredient. Said raw emperature of a solvent, and by carrying out a copolymerization reaction at the temperature of 50~150 ** nolegular weight of the copolymen to generate is also controllable using chain transfer agents, such as 1briethoxysilane. A raw material (a) and the use rate with (b) are as sforementioned. If there is less smount same as the organic solvent of the ingredient described later (D₂). Although limitation in particular is not sicumyl peroxide, benzoyl peroxide, t-butyl par benzoate, acetone peroxide, etc. are illustrated. Although .0032]When performing a raw material (a) and the copolymerization reaction of (b), n-propanethiol. The of the raw material (b) used than said range, the adhesive property between finishing coat and a primar [0033]As polyorganosiloxane used as a raw material (d) of the aforementioned (B_2) ingredient, Although arried out as said free radical initiator, can use an azo compound or organic peroxide and, for example colymerization initiator). In this reaction, the usable kind and quantity of an organic solvent may be the specifically, Azobisisobutyronitrile, 1-butyl hydroperoxide, a cumene hydroperoxide, di-t-butyl peroxide nethacryloxy propyl trimethoxyailana, 3-methacryloxypropyl tricthoxysilane, 3-methacryloxypropyl tris imitation in particular is not carried out, 0.01 to 1 weight \$ is suitable for the quantity of a free radical nexanethiol, 1-decanethiol, benzenethiol, 3-mercapto propyltrimethoxysilana, and 3-mercaptopropyl particular is not carried out, 3-acryloxyprophyltrimethoxysilane, 3-acryloxyprophyltriethoxysilane, 3natarial (a) and (b) is about obtainad the temperature from a room temperature to the flowing-back acryloxyprophyl tris (ethoxyethoxy) Silang, 3-aoryloxyprophyl tris (mathylathyl ketoxime) Silang, 3ethoxyethoxy) Silang, 3-methacryloxypropyl tris (methylethyl ketoxime) Silang, etc. are mentioned. preferably, for example under existence of an organic solvent and a free radical initiator (radical ayer will fall, and a primer layer will become weak if conversely more than said ranga. nitiator to a raw material (a) and the total quantity of (b).

(1008) as polycognosilosons used as a row massel (10 of the piccentrolined QL) improdent, Athough interests in produce in the card of the card of the piccentroline QL interests of the piccentroline of the piccentroline

carried out, a phthalic acid anhydride, a maleic acid anhydride, a hexahydrophthalic anhydride, a pyromellitic system hardening agent is recommended. As such an acid anhydride, although limitation in particular is not [0035]As for the amount of the aforementioned (B2) ingredient used, although limitation in particular is not carried out, it is proforred that they are 100 or less weight sections as solid content to the ingredient 100 aforementioned (h_2) weight section. (B_2) if the amount of ingredient used exceeds 100 weight sections, an adhesive property will fall. General formula (VII) of epoxy modified silicone oil which is the aforementioned (C_2) ingredient as an example of ${
m R}^9$, inside, Although limitation in particular is not carried out, aryl groups, aminea, etc. may be used as tha hardening agant, it is not limited to these but a common hardening agont for epoxy resins can be applied. However, in order to live together in other ingrediants and stability in a mentioned. Although limitation in particular is not carried out as an example of R⁽¹⁾ an organic group etc. which have a glycidy group, a glycidoxy group, a 3.4-epoxycyclohaxy/ group, a 2.3-epoxy cyclopenty/io exysilane oxygen, auch as a giyoidyl group and a 3,4-oxy oyclohexyl group, and various aoid anhydrides. solution, and to cause hardening near ordinary temperature and to form a film, using an acid anhydride B₂) ingredient, Although it is the amount object of low thru/or a polymer containing a compound with anhydride, trimelitic anhydride, a dodecyl succinic acid anhydride, etc. are mentioned, for example. A such as alkyl-group; phenyls, such as methyl, ethyl, propyl, butyl, hexyl, and octyl, and tolyl, etc. are pardening agent may use two or more sorts together, using only one sort. group, etc. are illustrated. http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi.ejje?atw_u=http%3A%2F%2Fwww4.ipdl.inpit.go.. 2010/10/19

hydrogen siloxane, for example, although not necessarily limited. The amount of the epoxy modified silicons adhesion with a base material is not acquired as it is less than 0.1 weight %, but it exceeds 50 waight %, the ingredient and an ingredient (B2) preferably, although limitation in particular is not carried out. If sufficient oil used is 0.1 to 50weight % of within the limits to the sum total solid content of the aforementioned (A₂) [0036] Especially the epoxy modified silicone oil that is the aforementioned (C_a) ingredient is obtained by carrying out the addition reaction (hydrosilylstion) of the olefin natura apoxy monomar to a polymethyl

0037]As an organic solvent used as the aforementioned (D.,) ingredient, Although limitation in particular is cranydrofuran, and dioxane; Acetone, Ketone, such as methyl ethyl ketone and a diethyl ketone; Methyl not carried out, for example Methyl alcohol, ethyl alcohol, Alcohols, such as isopropyl alcohol; Ethylene acctate. Aliphatic hydrocarbon, such as ester species; n-hexane, such as ethyl acetate and n-butyl glood monomethyl ether, Ether alcohol or ether, such as ethylene glycol monoethyl ether, a nardenability of a primer will fall.

acctate, gasoline, a rubber solvent, a mineral spirit, and kerosene; aromatic hydrocarbon, such as benzene,

foliums, and xylene, is montioned. (D₂) ingredient used has preferred within the limits of ten to 5000weight section to the ingredient 100 aforementioned (A₂) weight section, although limitation in particular is not carried out. Since it will be necessary to give two coats repeatedly if worksbility falls and 5000 weight [0039]A curing catalyst can be used to harden at ordinary temperatura when you want to burn for a short time, the case where he would like to print comparatively the 3rd spoxy system primer paint containing sections are exceeded, sinca the viscosity of a primer paint will bacome high if there is less amount used these (A_{ρ}) (B_{ρ}) , (G_{ρ}) , and an ingredient (D_{ρ}) at low temporature, and. As for the amount of the ouring than 100 waight sections, workability falls too.

catalyst used exceeds 30 weight sections, foaming is produced at the time of baking of a primer paint, or a cost will be checked Athough imitation in particular is not carried out, as an example of a curing catalyst Dibutythin disurate, Dibutythin discotate, a butytin bird (2-othy)hexcate). The 1st tin of caprylic acid, satalyst used, although limitation in particular is not carried out, it is preferred that they are less than 30 relight sections to the ingredient 100 aforementioned (Λ_2) weight section. If the smount of the curing Manganese 2-ethylhexoste, zinc-2-ethylhexoste, Organic-carboxylic-acid metal salt, such as naphthenio acid titanium, zinc naphthenate, cobalt naphthenste, and zinc stearate; Tetrabutryl titanate, Totra (2ethythexyt) transte, triethanolamine transte, Organio tranium soid ester, such as tetra (scopropenyloxy) trisnate; ORGANO siloxy tranium, Organio tranium compounds, such as beta-carbonyl tranium; gammacuring catalyst will coze on the surface of primer cured coating, and an adhesive property with finishing naphthonic soid tin, oleic soid tin, iron-2-ethylhexoste, Lead-2-ethyl octoste, cobalt 2-ethylhexoste,

carbon black, and iron oxide, a various filler and distribution auxiliary agent, an antioxidant, an ultraviolet ray the top cost used by this invention. To for example, the colloidal silica distributed by an organic solvent or absorbent, a dripping stop agent, etc. if needed. Silica distribution oligomer which is an ingredient (A_0) of ydroxylamine, such as diethylhydroxylamine; guanidine compounde, such ss tetramethyl guanidine, and The lower-fatty-aoid salt of alkalina metals, such as a lithium oxelate; Dimethylhydroxylamine, Dialkyl guanidyl group content Silang, or a siloxane compound can be mentioned. [0040]Said 3rd epoxy system primer paint may contain further color pigments, such as titanium oxide,

aminopropyl triethoxysilane, Amino alkyl-group substitution alkoxysilane, such ss N-(trimethoxysilybropyl)

ammonium salt [, such ss benzyl triethyl ammonium acetate,]; — potassium scetate snd sodium acetate.

sthylcnediamine; Hexylamine, sminc compounds, such as phosphoric soid dodecyl amina, or salt; --- 4th

obtained by carrying out partial hydrolysis of this hydrolytic organosilane under the conditions which use a 0041]As basis R¹ in the hydrolytio organosilane exprassod with said general formula (I), Although limitation per said 1 Eq of hydrolytic basis (X)s about the water or the water added separately in colloidal silica. It is organosilane expressed with said general formula (I) or two sorts or more are added, it is water 0.001-0.5 water (the mixed solvent of an organic solvent and water is also included). One sort of the hydrolytic

group, Cyclosikyi groups, such sa e cyclohexyi group; 2-phenyisthyl group, Aralkyi groups, such as 2-phenyipropyi group and 3-phenyipropyi group; A phenyi group, Aryi groups, such as a tolyi group; Alkenyiin particular is not carried out, for example A methyl group, an ethyl group, a propyl group, Alkyl groups, such as a butyl group, a pentyl group, a hexyl group, a heptyl group, and an octyl group; A oyolopentylic group; chloromethyl groups, such as a vinyl group and an allyl group, Halogenation hydrocsrbonttp://www.kipdl.inpit.go.jp/ogi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwwwk.ipdl.inpit.go... 2010/10/19

0042]Aithough limitation in particular is not carried out as ssid general formuls (I) Neka and the hydrolytic basis X, an alkoxy group, an acetoxy group, an oxime group, an ENOKISHI group, an amino group, aminoxy, an amide group, etc. are mentioned, for exampla. Also in these, since it is easy to prepare an ease of 0043]As an example of said hydrolytic organosilane. The alkoxysilane of each functionality of mono-, di-, tri-, and tetra- whose m of said general formula (I) Naka is an integer of G-3, acetoxysilane, oxime silanes, hackberry gardenia fruit orchid species, aminosilanes, friend NOKISHI silanes, and amide silanes are group;gamma-methsoryloxypropyl groups, such as gamma-chloropropyl group and a 3,3,3-trifluoropropyl group, Substitution hydrocarbon groups, such as gamma-glycidoxy propyl group, a 3,4-epoxycyclohexyl cityl group, and gamma-mercaptopropyl group, etc. can ba illustrated. Also in these, the alkyl group of a composite ease or the sass of acquisition to the carbon numbers 1-4 and a phenyl group are preferred mentioned. Also in these, since it is easy to prepare an ease of acquisition, and a silica distribution noquisition, and a silics distribution organosilane oligomer solution, an alkoxy group is preferred. organosilane oligomer solution, alkoxysilane is preferred.

directhoxysians, etc. and as bird organoalkoxysians of m=3. Trinethylmchtoxysians, etc. on be illustrated. An etchydeboxysians, dramithyl isoproprospians, directlydeboxysians, etc. on be illustrated. An erganoalians compound generally aslied a sliens coupling agent is also ontribined in alkoxysians. non-drainage systems, such as water dispersibility or alcohol, for example. Generally, such colloidal silica is trifunctional [which is expressed with m= 1]. This is 50-mol %. Dry hardanability is easily inferior while film hardness sufficient in the following is not obtained. As colloidal silica in the aforementioned (A_{Ω}) ingredient, lispersibility colloidal silica can be essily obtained as a commercial item. The kind of organic solvent which trinetoxysilane, etc. can be illustrated. As a JIORUGANO dialkoxy silane of m= 2, Dimethyldimethoxysilane although limitation in particular is not carried out, it can use organic solvent dispersibility colloidal silica of 20 to 50 weight % about the silica as solid content. It contains and silica loadings can be determined from this value. When using water dispersibility colloidal silloa, the water which exists as ingredients other than solid content can be used for hydrolysis of said hydrolytic organosilane. Water dispersibility colloidal silica discetone alcohol, etc. can be mentioned, and one sort chosen from the group which consists of these, or cthanol, isopropanol, Lower sliphatic alcohol, such as n-butanol and isobutanol; Ethylene glycol, Ethylane we sorts or more can be used. It can use together with thase hydrophilic organic solvents, and toluene, [0045]the inside of the indrolytic organosilane expressed with said these general formula (05, and more then 50 mol % — desirable — 60-mol % — the above is gyool derivatives, such as ethylsne glycol monobutyl ether and acetic acid ethylene glycol monoethyl sther, A diethylene glycol, Diathylane-"glycol derivative [, such sa diethylans-glycol monobutyl ethar,]. colloidal silica by an organic solvent. Such organic solvent dispersibility colloidal silica as well as water 0044]Especially as tetra alkoxysilane of m= 0, Can illustrate a tetramethoxy silane, a tetraethoxysilane can usually be easily obtained as a commercial item, although made from water glass. Organic solvent colloidal silica is distributing. Although limitation in particular is not carried out, for example Methanol, ilmethyl diethoxysilane, diphenyldimethoxysilane, Can illustrate diphenyl diethoxysilane, methylphenyl dispersibility colloidal silica can be easily prepared in replacing the water of said water dispersibility eto, and as organotrialkoxysilane of m= 1, Methyl trimetoxysilane, methyl triethoxysilane, a methyl triisopropoxy silane, phenyltrimethoxysilane, phenyltriethoxysilane, 3 and 3, 3-trifluoropropyl

5 weight %, desired film hardness will not be obtained, but on the other hand, when 95 weight % is exceeded 55weight % of within the limits more preferably ten to 90weight % five to 95weight %. If content is less than partial hydrolysate is not obtained as it is lass than a mol, but 0.5 mol is exceeded, the stability of a partial [0047]0,001–0.5 per Eq of hydrolytic basis (X) in which said hydrolytic organosilane has the quantity of the mentioned above It is within the limits which is a mol. The amount of the water used is 0.001. If sufficient ydrolysis, for example, to mix a hydrolytic organosilane and colloidal silica, and just to carry out addition combination of the water of an initial complement, and a partial hydrolysis reaction advances at ordinary ydrolysate will worsan. What is necessary is not to limit the method in particular of carrying out partial weight which converted content Si into SiO₃). It is considered as solid content and contains by 20 to water used when proparing silica distribution oligomer which is the aforementioned (A_{th}) ingredient as [0046]Colloidal silica is [be / it / under / aforementioned (An) ingredient / setting] a part for silica emperature in that case. In order to promote a partial hydrolysis reaction Chloride, acetic acid, the uniform dispersion of silics may become difficult and an ingredient (A_0) may gel.

cylene, ethyl acetate, butyl acetate, methyl ethyl ketone, methyl isobutyl ketone, methylathyl ketoxime, eto.

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ialogenation Silang. Organio acid and inorganio acid, such as chloracetic acid, citrata, banzoio acid, sull'artivitationic acid, fornice acid, propionio acid, a glattice acid, giycelic acid, maleio acid, malenio acid, pilenensificiole acid, and oxalic acid, may be usad as a catalyst.

1048] in order that the afronmentioned (Δ_j) improduct may obtain the parformance by being stabilised over the right product of time—the parformance by their guardatised over the right product of time—the parformable Learning beautiful to more —desirable —250.70 min order to set 200.00 min or parformable sproducing the amount of the water used in 3.9 per hydrolytic mass (3.0 per producing $T_{\rm cont}$) are considered to consider the right producing the experimensed business of an experimental producing of an interesting of the production of the part producing the pro

be to add basic respects, usual as amenois and exhiberosismisms, and just to eights to H if it is na additive and nature to an additive that and start to eight the limit and respects, such as otheride, infinite oid, and seatle oid. And seatle oid from this arrange it is a basicly tied who may not find an imporfact it outside a mentioned range. However, the

00.008/j. At it maid awage convenient for manufal off the state of goue context project genedations used it is the decreased (Qs.) ingredient; it is not carried out to especially finishing is said formula (0).

Whough the same thing a survey if it illustrated desirable— addition injection ground survey as such as led in those of the carbon number if -2 a through groun, a vivil result, generally expected groun, and the survey of groun, maken if -2 a through groun, a vivil result, generally expectively groun. — they are survey that the color properties of ground ground medity are not a privately. The failed of aid formula (0), and a said for a number medity from and a privately cause more privately. The failed of aid formula (0), and a said as a number which ground are a failed formula (0), and a said to a number as the problems of control from the color control in the failed or the failed for the color failed and to do so number as the problems a control for survey of some these if the failed result of some the surface control (1) when the color and the color and the surface of the surface control (1) when the color and control (1) and control (2) are more). Intelleming of bods not

otherines well by less than One upon centent polyregenosiloseme, although not incesserably limited especially—
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is stating upon an a state owncy process to experime may be continued, seem it cleans accommend to the process of the continued of the continu

centricion in particular.

(DOGAE) Leukaning mass between the alcoronationed (Ag.) ingredient and the aforementioned (Bg.) ingredient and the activities of the insertation of the last sets to produce a section of all the activities of the activities of the insertation of the insertation of the activities and the sets to produce a section of all, and for the activities and the insertation of the insertation of the produce and the insertation of the produce and the insertation of the i

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oper; a consider gain re- to produce A princip gene, I conduct growing a conduction for a consider and makes a conduction gain re- amount of CORGS/Dubengh for the thickness of the film formed from and too cost not to two re-strateging an articular and what it is measurely a list. Of 1.00 fmm, and order to be study to film, the long not not do re- and for realized not one orderidate on code to be study for the long not and for realized as of the code orderidate. The code of the code ordering a service film results of the code ordering a service film result or the code of the code ordering a service film result or the code of the code ordering a service film result or the code of the code ordering a service film result or the code of the code ordering a service film result or the code ordering a code ordering a service film results or the code ordering and service film results or film results or the code ordering ordering and service film results or the code ordering ordering and service film results or the code ordering ordering and service film results ordering order

ingredient, resistance to contamination excellent in a coated plate is given.

o remove dirt of dust, dust, etc., such as adhesion and soribble, easily, there is an effect also in prevention slending optimum dose with top coat from a large thing of n to a small thing as an ingredient (Gp) is formed cesult, since a R² group covers a paint film surface and a pollutant (a gas, a solid, a liquid) is not allowed to paint film surface, even when a pollutant acherea, it makes it possible to remove it easily (decontamination ayer in a paint film surface in a small quantity. On the other hand, n gives pliability to a coat by it not only and OH carries out a condensation reaction to OR group of bulk, and remains in a paint film surface. As a nature is high), and a mold-ralasse characteristic over adhesives etc. is given. Therefora, while being able of a poster etc. Said empirical formula (III) of an ingredient (G_0) inner n is abla for a large thing to form a particle, it gathers in a paint film surface easily, and a monomolecular layer is formed, but eventually, the polysiloxanediol) which is an ingredient (Go) gives resistance to contamination excellent in a film formed ncorporated into bulk in a paint film surface, and it leads also to a crack preventive effect. Therefore, a come near, rasiatanca to contamination is raised by leaps and bounds. Sinca a R2 group has covered a Therefore, since perfect compatibility in inside of a paint is missing and it is distributing as an ultrafine especially among ingredients contained in said top cost, Since this (Co) ingredient does not have any soat where a crack could not enter easily and which was excellent in resistance to contamination by [0058] A straight-chain-shape both-ends hydroxyl group content polysiloxane (straight-chain-shape forming a layer, but a small thing having the high reactivity of an end OH radical, and being easily reaction groups other than an end OH radical, it is a molecule comparatively lacking in reactivity.

(1008)State top cost contries (4), (B_c), and D_c) are irrepected in addition to an invariant (G_c), (A_c) Silos af articular dispersion objects which are invariant to examine the hydropic basis as functional group less (1 a including reaction the numb ingredient of the tass polymer which it has all conditional sizes in (A_c) invarient, while insuring that the test in find metall for improve the smooth matter of a film, and conditional sizes in (A_c) invarient, while insuring the antique contribution of the properties of the participates in order odding formation. The amonoth nature the reaction and it is apprehensively in the contribution of the contribution of a participate in order odding formation. The amonoth nature the reaction of the contribution of a final final are also in all the curing stability which is (D_c) imprefier promotes to be condensation reaction and it is participated in the contribution of a surface of the curing stability which is (D_c) imprefier promotes to be condensation reaction and a contribution of the curing stability which is (D_c) imprefier promotes to be condensation reaction of the curing stability which is (D_c) imprefier promotes to be condensation reaction of the curing stability which is (D_c) imprefier promotes to be condensation reaction of the curing stability which is (D_c) imprefier promotes to the condensation reaction of the curing stability and the curing stability which is (D_c) imprefier promotes to the condensation reaction of the curing stability and the curing stability

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IP,09-141193,A [DETAILED DESCRIPTION]

shove (A_o), (B_o), and (C_o) an ingredient, and stiffens a film.

carrying out low-temperature heating, a condensation reaction is cerried out and cured coating is formed under existence of the ouring catalyst which is the eforementioned (Do) ingredient. Therefore, unlike the constituent for coating conventional moisture ouring type, said top coat containing these ingredients is ngredient, and the silanol group in the above (B₀) and (C₀) an ingredient, In ordinary temperature, by (0060)The hydrolytic basis contained in silica distribution oligomer which is the aforementioned (A₀) hardly influenced by humidity, also when hardening at ordinary temperature. When heat-treated, a

chemical resistance (when the said 2nd or 3rd epoxy system primer paint is used especially as a primer contamination of a coated plate and endurance are maintained in the long run. Adhesive strength and 10061]In the coated plate concerning this invention, since the primer layer which intervenes between finishing coat and a base material is formed from an epoxy system primer paint, the resistance to condensation reaction is promoted and cured coating can be formed.

and finishing coat and the endurance of a coated plate are raised, and it leads to maintenance of the longerm resistance to contamination of a coated plate, and endurance as a result.

basis to these, and the endurance of sillcone — being added — the long-term adhesion of a base material

paint which forms a primer layer) of a primer layer the adhesion according to the reaction of a hydrolytic

the base meterial 1 from the spoxy system primer paint, It has the finishing cost 3 formed in the surface of 0083]Although the concrete embodiment and comparative example of this invention are shown below, this Mode for carrying out the invention] Drawing 1 expresses one embodiment of the contamination-resistant coated plate concerning this invention. This coated plate has the primer layer 2 formed in the surface of this primer layer 2 from the top cost containing the above (A_0) , (B_0) , (C_0) , and (D_0) an ingredient

nvention is not limited to the embodiment stated to the following embodiment and the top. Below, all

parts shows a weight section and expresses weight \$ 'all' \$.
Embodiments 1-8 - [Production of a contamination-resistant coated plate] The contamination-resistant coated plate was produced using the material and the method which are shown below.

Base-material-1: The Nozawa flexible sheet by Nozawa Corp. (the fiber reinforced cement plate within JIS-A5430 standard; flexible board 910x2420x6 mm).

Base-material-2: A commercial rolled plate (Japanese Test panel purchase; JIS-G3101 conformity;

Base-material-3: Asano Slate Co., Ltd. make Asano tie RAKKUSU FA-T (the board which stained water 910x2420x3 mm).

0085]Base-material-5: Lumilar by Toray Industries, Inc. (polyester film; 1000x2000x0.05 mm). Pase-meteriel-4: Teijin Chemioals PO-1111 (polyoarbonate sheet; 1000x2000x3 mm). glass on the slate plate; 1210x1820x4 mm).

The primer which consists of $-(A_1-1)(D_1-1)$ ingredient and the organic solvent below Primer 3. (40% of Primer 2: EPORO 2 primer (ISAMU PAINT GO., LTD. make; two-component type epoxy resin primer). Primar 1: EPORO E sealer (ISAMU PAINT 00., LTD. make; two-component type epoxy resin seeler). 9900

(A,-1): Epicoat 828 (trade name of ShellChemical; weight per epoxy equivalent 190) 100 copy. active principle; viscosity of 5.0 cps; reddish brown transparence).

(B₁-1): N,N,N-tris 3-(trimethoxysily!) propy! 100 copies of isoSHIANURATO.

C,-1): the first four copies of tin of octanoic soid.

(D₁-1): 100 copies of diphenyldimethoxysilane.

Organic solvent 760 copies of toluene,

preparing method below Primer 4, 2.5 copies of following (C_2-1) ingrediants and 50 copies of ingredients 100 copies of ingredients (A_2-1) and (B_3-1) 7.5 copies of ingredients which were obtained with the (D_2-1) , and a mixture with one copy of curing cetalyst.

A,-1) To the reaction vessel provided with the stirrer, the condensator, and the thermometer (preparation of an ingredient). It polymerized by heating for 8 hours at 70 ** in a nitrogen gas atmosphere, having added 0.33 copy of ezobisisobutyronitrile as 100 copies of methyl methecrylate, 13.1 copies of 3-methacryloxy propyl trimethoxysilanc, 226.2 copies of toluene, and a polymerization initiator, and stirring uniformly. Subsequently, the polymer solution (A,-1) (ingradient) which is a water-white liquid was obtained by

adjusting a nonvolatile matter to 50% by distiling off a part of toluene with a low fraction. [0069](B₂-1) Seven ooples of dimethy/dichlorosilanes (oreparation of an ingradient). The mixture produoed methanol mixed liquor in a container with a reflux condensor, stirring keeping temperature at 50 ** or less parried out the byproduction was removed. The silicone resin toluene solution of 50% of concentration was obtained by heating under decompression of this and removing the water which remains as some solvents. Subsequently, 70 copies of bisphenol A epichlorohydrin type epoxy resins of the weight per epoxy equivalent 250, Heating was continued for further 5 hours, maintaining the temperature, when temperature 0070]The generated polymethyl phenyl sitoxane was diluted with water and the hydrogen chloride which p was gradually carried out under stirring and it amounted to 230 **, having propared the solution which consists of five copies of phthalic soid anhydrides, ten copies of linseed-oil fatty acid, and 75 copies of toluene, and removing toluene. After adding 60 copies of previous silicone resin toluane solutions, and toluene to this and adjusting [this] total-solids concentration to 50%, spoxy denaturation silicone resin phenyltrichlorosilanes with 95 copies of toluene, It was dropped into 50 copies of 350 copies of water by mixing 40 copies of methyltrichlorosilanes, 48 oopies of diphenyl dichlorosilane, and 78 copies of B₂-1) (ingredient) was obtained by stirring until a solution becomes trensparent. and the hydrolysis condensation reaction was performed.

 (O_2-1) Ingredient : Were obtained by making allyl glycidyl ether add to methil hydrogen polysiloxane. Epoxy denaturation silicone of said structural-formule (VII) (however, R9=CH,-, the epoxy functional organic group of the formation 4 of the bottom type of R¹⁰ =, p**33, q**32).

Chemical formula 4]

Curing ostalyst: dibutyltin dilaurate. ngredient: (D,-1) Ethyl scetate.

Primer 1: Air spray painting (coating pressure of 2.5 kg / om²; the Iwata spray gun W-88 (H5) is used). Coating method of a primer paint)

Primer 3: Air spray painting (coating pressurs of 2.5 kg / cm², the Iwata spray gun W-88 (H5) is used). Primer 4: Air spray painting (coating pressure of 2.5 kg / cm², the Iwata spray gun W-88 (H5) is used). Primer 2: Roller painting (the hair roller in 7 inches is used).

Dry curing method of a primer paint) All various primer paints are ordinary temperature dry hardening (for Top coat) The example of the preparing method of an ingredient (A_{fc}) is explained first. (0074)(An) (example of preparation of an ingredient) shout 20 ** and one day).

10-20 --- m micro) 30% of solid content, moisture 0.5 %, Nissan Chemical Industries, Ltd. make 100 copy, 68 preparation of an ingredient), methanol distribution colloidal silica -- sol --- MA-ST (the particle dameter λ_0 –1) an agitator and warming — in the flask furnished with a jacket, a capacitor, and a thermometer

copies of methyl trimetoxysilane, and water 2.7 After performing a partial hydrolysis reaction over about 5 hours at the temperature of 65 **; supplying and stirring a part, the ingredient was obtained by cooling (A_o-1). Solid content when this thing was allowed to stand at the room temperature for 48 hours was 36%. (A_0-1) preparation conditions of an ingredient. - Number of mols $0.1-(A_0-1)$ of the water per $1 \to 0$

hydrolytic bases Silioa part contant of an ingradient Mol % 100 of the hydrolytic basis content organosilane

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of 47.3% and m=1 A mol % (A₀-2) (preparation of ingredient) Sand grinder is used. The white paint (A₀-2) Ingredient) was obtained by distributing 20 copies of white pigments ("R820" by Ishihara Sangyo Kaisha, Ltd.) in 100 copies of aforementioned (A₀=1) ingredients.

diameter 10-20 — m micro) 30% of solid content, moisture 0.5 %, Nissan Chemical Industries, Ltd. make 100 acetic anhydride 0.1 After performing a partial hydrolysis reaction over about 3 hours at the temperature of copy, 68 copies of methyl trimetoxysilane, 18 copies of dimethyldimethoxysilane, and water 8.1 A part and 80 **, supplying and stirring a part, the reaction mixture was obtained by cooling. Solid content when this (ingredient) was obtained by distributing 15 copies of brown pigments (KN-V by Toda Kogyo Corp.) with a preparation of an ingredient), isopropyl alcohol distribution colloids! silica -- sol -- IPA-ST (the particle (A_0-3) an agitator and warming — in the flask furnished with a jacket, a espacitor, and a thermometer thing was allowed to stand at the room temperature for 48 hours was 38%. The brown paint (A_n-3) paint shaker in 100 copies of this reaction mixture.

 λ_0 -3) preparation conditions of an ingredient: the number [] of mols of the water per 1 Eq of – hydrolytic content organosilane of 40.2% and m=1 --- next. (B_n) The example of the preparing method of an ingredient bases — silica part content [] of 0.3 and (A₀-3) an ingredient — mol % 77-mol% of the hydrolytic basis

0077](B_D) (example of preparation of an ingredient)

dropping funnel and a thermometer, and it is the 1% hydrochlorio soid aqueous solution 108 to this mixture. (B_n-1) an agitator and warming — a jackat and a capacitor — (preparation of an ingredient). A mixture of 4 part was dropped over 20 minutes and a methyl triisopropoxy silane was hydrolyzed. When stirring was removing chloride which remains in a resin solution of toluene which remained behind and carrying out decompression removal of the toluene further, by diluting with isopropyl alcohol. An isopropyl alcohol 40% sopropyl alcohol having contained a small amount of chlorides is separated. After washing in cold water solution (B_n-1) (ingredient) of silanol group content organopolysiloxane of the weight average molecular nethyl trisopropoxy silanc 220 part (1 mol) and toluene 150 part is taught to a flask furnished with a stopped 40 minutes after dropping, it separated into a bilayer. Mixed liquor of lower layer water and weight 2,000 [about] was obtained.

obtained by performing a dehydrating condensation reaction of silanol group content organopolysiloxane at solution of silanol group content organopolysiloxane was obtained except having changed the last diluent (B_0-2) By the same operation as a preparing method of the aforementioned (B_0-1) ingredient, a toluene olvent into toluene (preparation of an ingredient). Then, a toluene 40% solution (Bn-2) (ingredient) of ilanol group content organopolysiloxane of the weight sverage molecular weight 10,000 [about] was temperature of 150 ** for 12 hours.

removing the water and chloride which carry out liquid separation removal of the lower layer hydrochloric sold water divided into the bilayer, next remain in the toluene solution of the upper organopolysiloxane with (0.3 mol) of dimethyldichlorosilanes, and 84.8 copies (0.4 mol) of phenytrichlorosilanes. It was dropped under strings of what was dissolved in the part, and the hydrolysis reaction was performed. After stopping molecular weight of the standard polystyrene conversion searched for. Future molecular weights were also acetone and further 44.8 copies (0.3 mol) of methyttrichlorosilanes, it is the toluene 200 about 38.7 copies group content organopolysiloxane of the weight average molecular weight 3,000 [about] was obtained. In (C_0) (ingredient) : — said formula (III) — straight—chair—shape polysiloxanediol (polydimethyl siloxane diol) the above-mentioned preparing method, a molecular weight is GPC (gel permeation chromatography) (measuring apparatus species name: HLC-8020, TGSOH CORPORATION make). It is the weight average (Bn-3) an agitator and warming --- a jacket and a capacitor --- (preparation of an ingredient). To the flask superfluous toluene by decompression stripping. The toluene 60% solution (Bn-3) (ingredient) of silanol furnished with a dropping funnel and a thermometer, it is the water 1,000. Part, Prapare 50 copies of stirring 40 minutes after dropping, moving reaction mixture to a separating funnel and settling it, By which R2 is CH, inside and has the weight average molecular weight (Mw) shown in Tables 1 and 2. neggured in the similar way.

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IP,09-141193,A [DETAILED DESCRIPTION]

(D_p) (ingredient): N-beta-aminoethyl gamma-aminopropyl methyl dimethoxysilane or N-beta-aminoethyl gamma-aminopropyl triethoxysilane.

(Praparing method of top coat) By the combination shown in Tables 1 and 2, top coat was obtained by carrying out mixed stirring of the above (A_0) , (B_0) , (G_0) , and (B_0) the ingredient.

(Costing method of top coat) All were painted with the air apray (coating pressure of 2.5 kg / cm²; the wata apray gun W-88 (H5) is used). Dry curing method of top coat)

Embodiments 1–5: Ordinary temperature dry hardening (for about 20 ** and three days)

0080](1) The 1 contamination method of contamination-resistant ***** : 24-hour neglect after writing a (Valuation method of a contamination-resistant coated plate) The method shown below estimated the contamination-resistant coated plate, and the result was shown in Tables 1 and 2. Embodiments 6-8; Stoving hardening (for 90 ** and 20 minutes).

Valuation method: Visual observation of the adhesion grade of magic and the state of a character was carried out, and the following three-stage estimated. character by oily magic.

 Two costed plates of contamination—resistant ****** were installed to the 30-degree inclination x. Magio is not crawled but a character can also be deciphered clearly. 0081]**: Although magio is crawled, it can read as a charactar. exposure test fence, and the direct weathering test was done. O : magic is crawled and it cannot read as a character,

Y value [before exposure] (first stage): — Y value after a Y_n atmospheric exposure test : Y contamination 0082]Valuation method: By a color difference meter, it is a colorimetry (XYZ display) about a coated plate Exposure conditions: For south, a 30-degree inclination (JIS).

rate : if D - D=(1-Y/ γ_0) ×100 - the soiling degree of a coated plate is expressed by this formula, and a [0083](3) Magic was wiped off with the dry waste cloth after the stain testing by the oily magic tricd with the 1 above (1) of decontamination ******** and visual observation of the remaining condition of the soiling degree is so low that a D value is small. The result of the contamination rate six months after exposure was shown in Tables 1 and 2.

magic marker was carried out. A result is based on the following three-stage evaluation.

**: The magic marker back remains.

O; a magic marker can be wiped off thoroughly.

4) Dirt was wiped off with the dry waste cloth after the six-month direct weathering test tried with the 2 above (2) of decontamination ********, and visual observation of tha remaining condition of dirt was carried out. A result is based on the following three-stage evaluation. x: A magic marker cannot be wiped off.

O : dirt can be wiped off thoroughly.

x: Dirt cannot be wiped off. **: Dirt remains a little.

2000 hours, and visual observation of the state of a cost was carried out. A result is based on the following (5) The accelerated weathering test was done with the weathering evaluation sunshine weatherometer for

O : abnormalities are not observed in a coat at all.

(6) The hardness of the paint film surface was measured by the pencil scratch test of pencil hardness test Fig. Gloss retention decreases a little and a crack arises at the end of a base material. c. A crack and separation arise in the whole base material.

- The coated plate was produced by the same method as Embodimant 1 except having produced top coat by the combination shown in Table 2, without adding a comparative example 1-(C_p) ingredient. Then, JIS-K5400 of a paint film surface.

http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.inpit.go... 2010/10/19 10087]- By the same method as Embodiment 1, the coated plate was produced except having used the

aforementioned (1) – (6) was evaluated.

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JP,09-141193,A [DETAILED DESCRIPTION]

oommercial fluorido paint (the new gar by TOHPE CORP. helmet **2000; white) as comparative example 2-top coat. Then, aforementloned (1) - (6) was evaluated. - Aforementioned (1) - (8) was avaluated, using the slate plate (said basa material-3) which applied comparative example 3-water glass as it is.

commercial acrylic resin sealer for morter as a comparative example 4-primer paint. Then, aforementioned 0088]- By the same method as Embodiment 1, the coated plate was produced except having used the (1) - (6) was evaluated. [6800

Table 11

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	8	新松松	0	0	0	0	0	0

[0090] [Table 2]

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nature compared with the coated plate of a comparative example so that it may see to Tables 1 and 2.

0093] Since the coated plate concerning this invention is excellent also in weatherability, decontamination Effect of the Invention]it excels in resistance to contamination, and can produce easily by coating work, nd the coated plate concerning this invention can be attached to various parts by simple construction. After construction can maintain the resistance to contamination and endurance over the long period of nature, and a mold-release characteristic, it can protect an article to be constructed from dust, dust, exhaust gas, scribble, and a poster over a long period of time, and it not only excels in resistance to contamination, but it becomes easy [washing after becoming dirty] ime of an article to be constructed.

[Translation done.]

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DRAWINGS	
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* NOTICES *

JPO and IMPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated. 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Sinford boundaries on provincing]
[Diesember_State sectional side elevation shrowing one embodiment of the contamination resistant coated puts a concurrent this invention.

10 section of the sectional side elevation shrowing one embodiment of the contamination resistant coated 1 flagment or formersial.

1 flagment material.

2 Primer layer 3 Finishing coat

Translation done.]